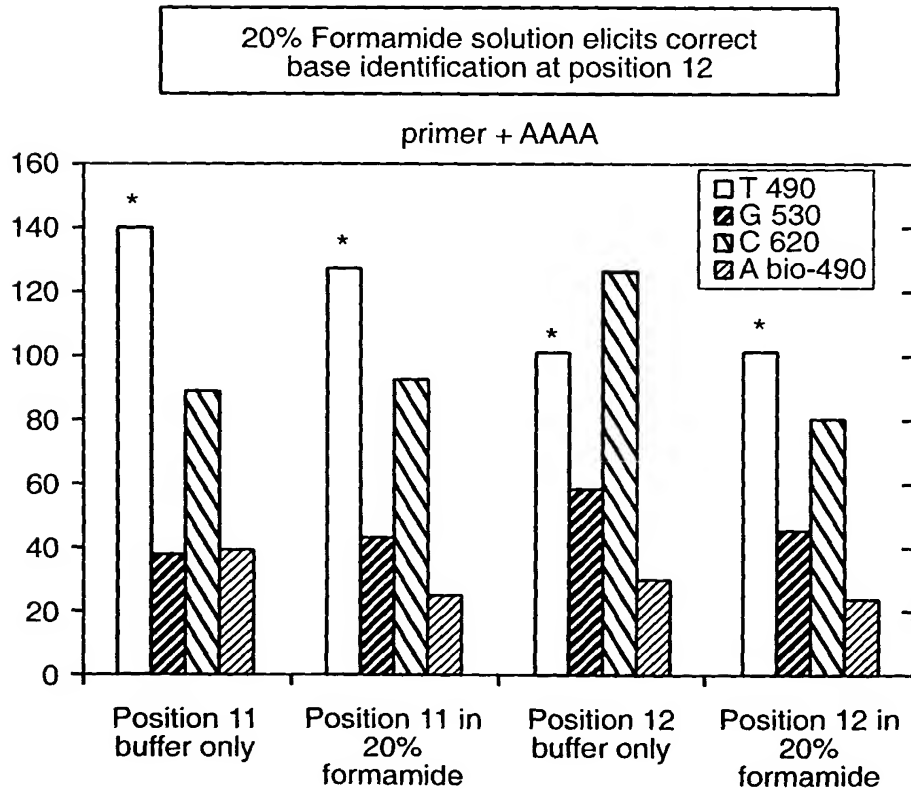


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FIG._1

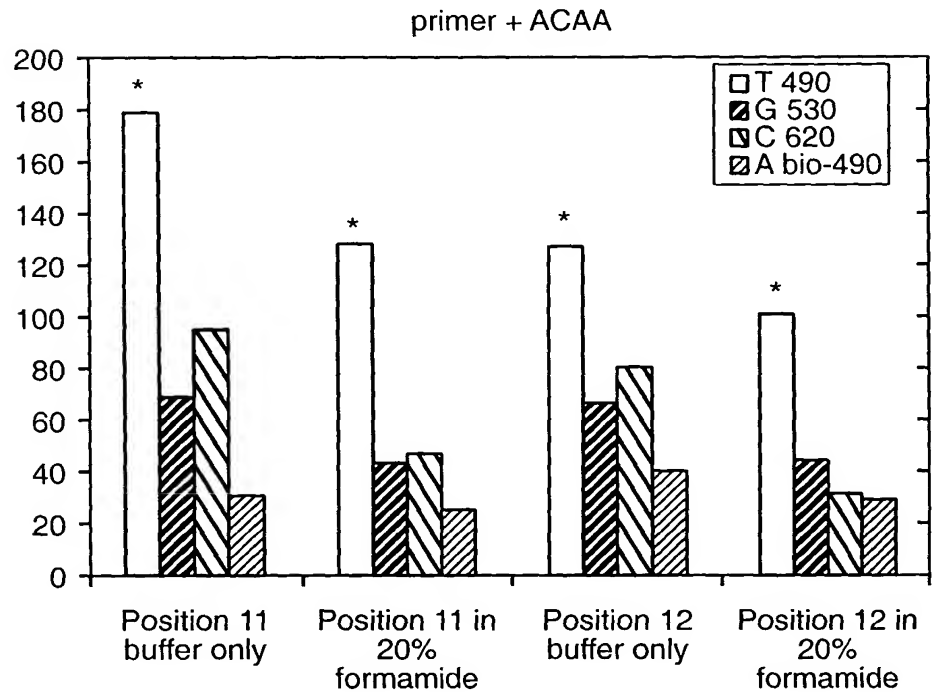
Correctly verified the identity of 14 probes using the same 4 target solutions

	<u>Probes on bead</u>	<u>Name</u>
T Cy5 G Cy3 C Fluorescein A Biotin + St-FI	GCG GTC CC AAAA	DC1
	GCG GTC CC GAAA	9G
	GCG GTC CC ACAA	10C
	GCG GTC CC CGAA	9C10G
	GCG GTC CC CAAA	9C
	GCG GTC CC TAAA	9T
	GCG GTC CC AGAA	10G
	GCG GTC CC ATAA	10T
	GCG GTC CC GCAA	9G10C
	GCG GTC CC TGAA	9T10G
	GCG GTC CC CCAA	9C10C
	GCG GTC CC CTAA	9C10T
	GCG GTC CC AAGA	11G
	GCG GTC CC AAAG	12G

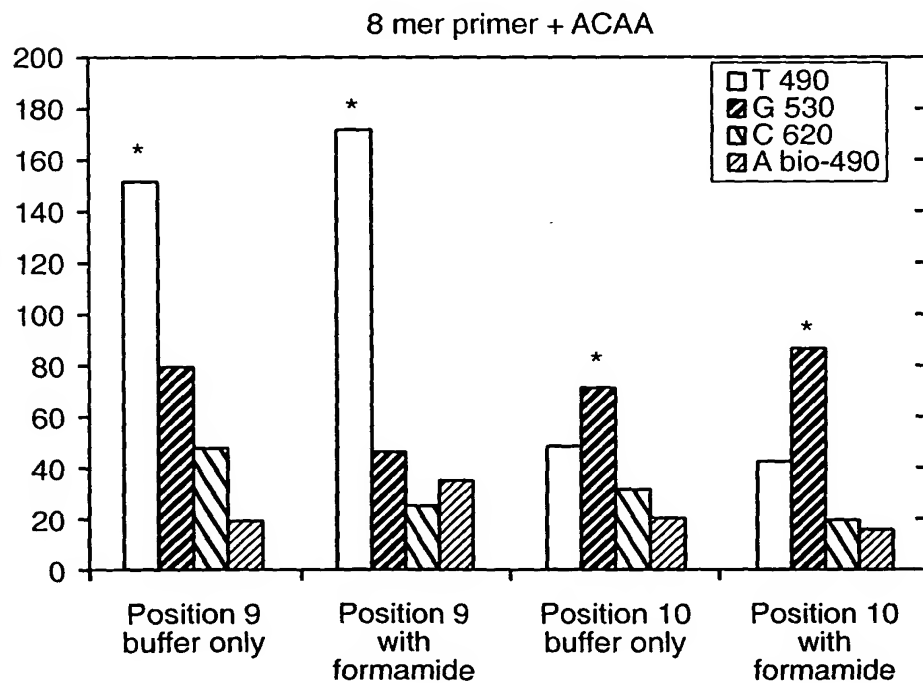
FIG._2

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Identification of the correct base at positions 11 and 12 is always achieved via competition using 20% formamide in the hybridization buffer





FIG._3

Identification of the correct base at positions 9 and 10 is achieved via competition in the hybridization buffer

FIG._4

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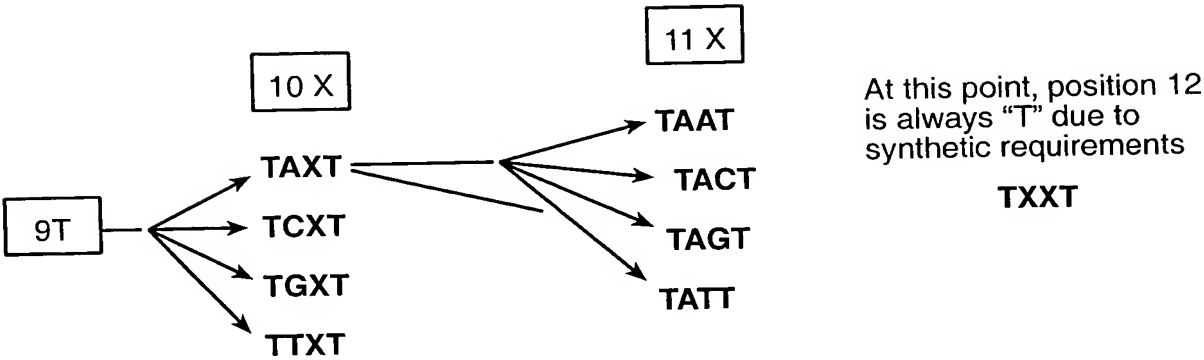
4 Different Probes Each on its own bead

Bead	Probe	Name
Bead 1	 GCG GTC CC AAAA <div style="position: relative; top: -20px; left: 100px;"> 9 10 11 12 ↓ ↓ ↓ ↓ </div>	DC1
Bead 2	 GCG GTC CC GAAA	9G
Bead 3	 GCG GTC CC ACAA	10C
Bead 4	 GCG GTC CC CGAA	9C10G

Interrogate position 9 with 64 targets in solution	Interrogate position 10 with 64 targets in solution
☆ CGC CAG GG TXXT ✱ -CGC CAG GG CXXT ☆ -CGC CAG GG GXXT ◁ -CGC CAG GG AXXT	☆ CGC CAG GG XTXT ✱ -CGC CAG GG XCXT ☆ -CGC CAG GG XGXT ◁ -CGC CAG GG XAXT

FIG._5A

Mx9T: ✧ CGC CAG GG TXXT is a combination of 16 targets



$$\boxed{1} \times \boxed{4} \times \boxed{4} = \boxed{16}$$

Interrogate position 9 with 64 (4 x 16) targets solution

- | | |
|---------------------------|------|
| ✧ <u>CGC CAG GG</u> TXXT | Mx9T |
| ⚙ <u>-CGC CAG GG</u> CXXT | Mx9C |
| ☆ <u>-CGC CAG GG</u> GXXT | Mx9G |
| ◁ <u>-CGC CAG GG</u> AXXT | Mx9A |

FIG..5B

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Interrogate position 9 with 4 targets in solution

- ✧ CGC CAG GG TTTT
- ⚙ -CGC CAG GG CTTT
- ☆ -CGC CAG GG GTTT
- ◁ -CGC CAG GG ATTT

Interrogate position 10 with 4 targets in solution

- ✧ CGC CAG GG TTTT
- ⚙ -CGC CAG GG TCTT
- ☆ -CGC CAG GG TGTT
- ◁ -CGC CAG GG TATT

Interrogate position 11 with 4 targets in solution

- ✧ CGC CAG GG TTTT
- ⚙ -CGC CAG GG TTCT
- ☆ -CGC CAG GG TTGT
- ◁ -CGC CAG GG TTAT

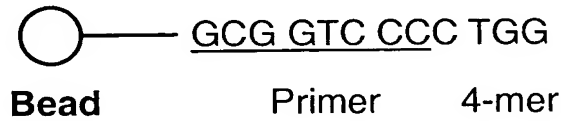
Interrogate position 12 with 4 targets in solution

- ✧ CGC CAG GG TTTT
- ⚙ -CGC CAG GG TTTC
- ☆ -CGC CAG GG TTTG
- ◁ -CGC CAG GG TTT A

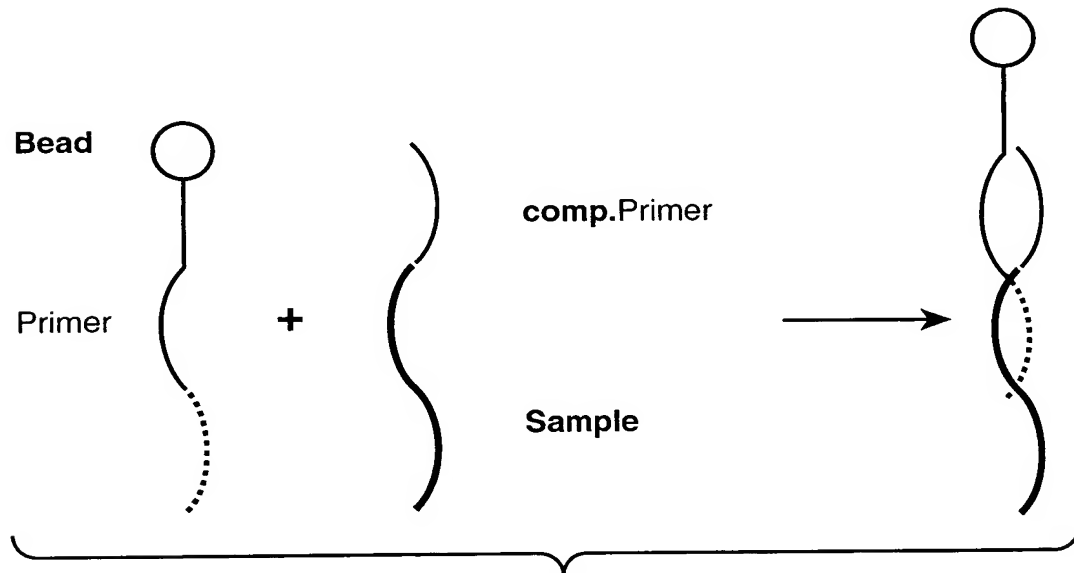
FIG._5C

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Using DNA array to sequence
with prepared DNA



Hybridize prepared DNA to array. Primer and 4 mer bind with complete specificity. The 4 mer will be identified by the bead.

**FIG._6**

Decoding Experiments

PRIMER
SEQUENCE **probe**

**FIG._7**